AMENDMENTS TO THE CLAIMS

Please amend the claims as set forth hereinbelow.

1.-2. **(cancelled)**

3. **(currently amended)** ~~The cylindrical processing method of Claim 2,~~ A method for cylindrical processing of an optical medium, comprising the steps of:
   a. rotating an optical medium about a longitudinal relative rotation axis thereof relative to a processing tool; and
   b. spatially selectively applying the processing tool to a portion of a surface of an optical medium, in operative cooperation with relative rotation of the optical medium and the processing tool, thereby producing spatially selective alterations in the optical medium,

   wherein the optical medium comprises a silica-based optical fiber including a core and a cladding layer, and the alterations include at least one ring.

4. **(currently amended)** ~~The cylindrical processing method of Claim 2, where~~ A method for cylindrical processing of an optical medium, comprising the steps of:
   a. rotating an optical medium about a longitudinal relative rotation axis thereof relative to a processing tool; and
   b. spatially selectively applying the processing tool to a portion of a surface of an optical medium, in operative cooperation with relative rotation of the optical medium and the processing tool, thereby producing spatially selective alterations in the optical medium,

   wherein the optical medium comprises a silica-based optical fiber including a core and a cladding layer, and the alteration includes a spatially selective surface mask.

5. **(currently amended)** ~~The cylindrical processing method of Claim 2,~~ A method for cylindrical processing of an optical medium, comprising the steps of:
   a. rotating an optical medium about a longitudinal relative rotation axis thereof relative to a processing tool; and
   b. spatially selectively applying the processing tool to a portion of a surface of an optical medium, in operative cooperation with relative rotation of the optical

medium and the processing tool, thereby producing spatially selective alterations in the optical medium,

wherein the optical medium comprises a silica-based optical fiber including a core and a cladding layer, and the optical medium includes a hermetic carbon outer coating and the alteration includes the step of spatially selectively removing the hermetic carbon coating.

6. **(original)** The cylindrical processing method of Claim 4, wherein the processing-tool-applying step includes the step of forming a surface mask by spatially selective deposition of mask material on portions of the optical medium.

7.-11. **(cancelled)**

12. **(original)** A method for fabricating a fiber-ring resonator comprising the steps of:
    a. rotating a resonator optical fiber about a longitudinal relative rotation axis thereof relative to a processing tool; and
    b. spatially selectively applying the processing tool to a portion of the optical resonator fiber, in operative cooperation with the relative rotation of the resonator fiber to the processing tool, thereby producing a resonator segment in the resonator fiber, the resonator segment having a circumferential optical path length differing from the circumferential optical path length of the resonator fiber adjacent to the resonator segment.

13. **(original)** The fabricating method of Claim 12, wherein the processing tool deposits material on the resonator fiber.

14. **(original)** The fabricating method of Claim 12, wherein the processing tool removes material from the surface of the resonator fiber adjacent to the resonator segment.

15. **(original)** The fabricating method of Claim 12, further including the step of providing an alignment member on the outer circumference of the resonator segment of the resonator fiber.

16. **(original)** The fabricating method of Claim 12, further including the step of altering the circumferential optical path length of the resonator segment, thereby

altering a resonant frequency of a resonator optical mode supported by the resonator segment.

17. **(original)** A method of fabricating an alignment member by cylindrical processing of an optical fiber, comprising the steps of:
    a. rotating an optical fiber about a longitudinal relative rotation axis thereof relative to a processing tool; and
    b. spatially selectively applying the processing tool to a portion of the optical fiber and the processing tool, thereby producing alterations of the optical fiber including at least one of a radially-projecting portion and a radially-recessed portion.

18.-23. **(cancelled)**

24. **(currently amended)** ~~The method of Claim 21, wherein~~
A method for producing a spatially selective alteration on a substantially cylindrical optical medium, the method comprising the steps of:
rotating the optical medium about a longitudinal relative rotation axis thereof relative to a processing tool; and
spatially selectively applying the processing tool to a portion of the surface of the optical medium, in operative cooperation with relative rotation of the optical medium and the processing tool thereby spatially selectively altering the optical medium to produce the spatially selective alteration thereon,
wherein the optical medium comprises an optical fiber, and the optical fiber includes a hermetic carbon outer coating layer.

25.-27. **(cancelled)**

28. **(currently amended)** ~~The method of Claim 21, wherein~~
A method for producing a spatially selective alteration on a substantially cylindrical optical medium, the method comprising the steps of:
rotating the optical medium about a longitudinal relative rotation axis thereof relative to a processing tool; and
spatially selectively applying the processing tool to a portion of the surface of the optical medium, in operative cooperation with relative rotation of the optical

medium and the processing tool thereby spatially selectively altering the optical medium to produce the spatially selective alteration thereon,

wherein the optical medium comprises an optical fiber, and the optical fiber comprises a hollow-core optical fiber.

29. **(currently amended)** ~~The method of Claim 21, wherein~~

A method for producing a spatially selective alteration on a substantially cylindrical optical medium, the method comprising the steps of:

rotating the optical medium about a longitudinal relative rotation axis thereof relative to a processing tool; and

spatially selectively applying the processing tool to a portion of the surface of the optical medium, in operative cooperation with relative rotation of the optical medium and the processing tool thereby spatially selectively altering the optical medium to produce the spatially selective alteration thereon,

wherein the optical medium comprises an optical fiber, and the optical fiber comprises a hollow-core optical fiber and the hollow core contains at least one of an optically scattering material and an optically absorbing material.

30. **(currently amended)** ~~The method of Claim 20, wherein~~

A method for producing a spatially selective alteration on a substantially cylindrical optical medium, the method comprising the steps of:

rotating the optical medium about a longitudinal relative rotation axis thereof relative to a processing tool; and

spatially selectively applying the processing tool to a portion of the surface of the optical medium, in operative cooperation with relative rotation of the optical medium and the processing tool thereby spatially selectively altering the optical medium to produce the spatially selective alteration thereon,

wherein the optical medium comprises an optical fiber, and the spatially selective alteration includes at least one ring between first and second segments of the optical fiber.

31. **(previously presented)** The method of Claim 30, wherein the spatially selective alteration includes at least one full ring.

32. **(previously presented)** The method of Claim 30, wherein the spatially selective alteration includes at least one partial ring.

33.-71. **(cancelled)**

72. **(currently amended)** ~~The method of Claim 71, wherein:~~

A method for producing a spatially selective alteration on a substantially cylindrical optical medium, the method comprising the steps of:

rotating the optical medium about a longitudinal relative rotation axis thereof relative to a processing tool; and

spatially selectively applying the processing tool to a portion of the surface of the optical medium, in operative cooperation with relative rotation of the optical medium and the processing tool thereby spatially selectively altering the optical medium to produce the spatially selective alteration thereon,

wherein:

the optical medium comprises an optical fiber;

the spatially selective alteration includes spatially selectively removal of optical material from the optical medium;

the processing-tool-applying step includes surface-masked wet etching;

the optical medium is a silica-based optical fiber including a hermetic carbon outer fiber coating;

a surface mask for the optical fiber includes at least a portion of the hermetic carbon outer fiber coating; and

surface-masked wet etching is performed with an aqueous hydrofluoric-acid-based etchant.

73.-81 **(cancelled)**

82. **(currently amended)** ~~The method of Claim 76, wherein~~

A method for producing a spatially selective alteration on a substantially cylindrical optical medium, the method comprising the steps of:

rotating the optical medium about a longitudinal relative rotation axis thereof relative to a processing tool; and

spatially selectively applying the processing tool to a portion of the surface of the optical medium, in operative cooperation with relative rotation of the optical

medium and the processing tool thereby spatially selectively altering the optical medium to produce the spatially selective alteration thereon,

wherein:

the optical medium comprises an optical fiber;

the spatially selective alteration includes spatially selective alteration of a refractive index of the optical medium;

the refractive index is increased by spatially selective optical-irradiation-induced densification of the optical medium; and

the optical fiber is a germano-silica optical fiber.

83. **(previously presented)** The method of Claim 82, wherein the germano-silica optical fiber is a pre-etched germano-silica-core multi-mode optical fiber.

84. **(previously presented)** The method of Claim 82, wherein the germano-silica optical fiber is hydrogen-loaded before irradiation.

85. **(previously presented)** The method of Claim 82, wherein the germano-silica optical fiber is boron co-doped germano-silica optical fiber.

86.-106. **(cancelled)**

107. **(currently amended)** ~~The method of Claim 93, wherein~~

A method for producing a spatially selective alteration on a substantially cylindrical optical medium, the method comprising the steps of:

rotating the optical medium about a longitudinal relative rotation axis thereof relative to a processing tool; and

spatially selectively applying the processing tool to a portion of the surface of the optical medium, in operative cooperation with relative rotation of the optical medium and the processing tool thereby spatially selectively altering the optical medium to produce the spatially selective alteration thereon,

wherein:

the optical medium comprises an optical fiber;

the processing-tool-applying step includes the steps of i) controlling relative longitudinal motion of the optical medium and the processing tool, and ii)

controlling relative radial motion of the optical medium and the processing tool; and

application of the processing tool to the optical fiber is synchronous with relative rotation of the optical fiber and the processing tool thereby producing a partial ring.

108. **(previously presented)** The method of Claim 107, wherein the processing tool comprises a processing beam, the processing beam being synchronously attenuated while the optical medium is rotated thereby producing a partial ring.

109.-151. **(cancelled)**

152. **(currently amended)** ~~The apparatus of Claim 150, further comprising~~ An apparatus for producing a spatially selective alteration on a substantially cylindrical optical medium, the apparatus comprising:

a processing tool;

an optical medium rotator, the rotator being adapted for rotating the optical medium about a longitudinal relative rotation axis thereof relative to the processing tool; and

a processing tool positioner, the positioner being adapted for spatially selectively applying the processing tool to a portion of the surface of the optical medium in operative cooperation with relative rotation of the optical medium and the processing tool thereby altering the optical medium to produce the spatially selective alteration thereon,

wherein:

the processing tool includes a processing beam source and a processing beam delivery assembly for spatially selectively delivering the processing beam to the optical medium; and

the processing tool positioner includes a shadow-mask adapted for spatially-selectively applying the processing beam to the optical fiber.

153.-166. **(cancelled)**

167. **(previously presented)** A method for fabricating at least one fiber-ring resonator on a resonator optical fiber, the fiber-ring resonator comprising a transverse fiber-

ring resonator segment integral with the resonator optical fiber between first and second segments of the resonator optical fiber, the resonator segment having a circumferential optical path length sufficiently different from a circumferential optical path length of an immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment, the method comprising the steps of:

rotating the resonator optical fiber about a longitudinal relative rotation axis thereof relative to a processing tool; and

spatially selectively applying the processing tool to at least a portion of a surface of the resonator optical fiber thereby producing a difference between the circumferential optical path length of the resonator segment and the circumferential optical path length of the immediately adjacent portion of at least one of the first and second segments of the resonator optical fiber.

168. **(previously presented)** The method of Claim 167, wherein the resonator segment is greater than about 1 μm in width.

169. **(previously presented)** The method of Claim 167, wherein the resonator segment is greater than about 2 μm in width.

170. **(previously presented)** The method of Claim 167, wherein the resonator segment is less than about 10 μm in width.

171. **(previously presented)** The method of Claim 167, wherein the resonator segment is less than about 4 μm in width.

172. **(previously presented)** The method of Claim 167, wherein the resonator segment is greater than about 10 μm in diameter.

173. **(previously presented)** The method of Claim 167, wherein the resonator segment is greater than about 20 μm in diameter.

174. **(previously presented)** The method of Claim 167, wherein the resonator segment is greater than about 100 μm in diameter.

175. **(previously presented)** The method of Claim 167, wherein the resonator segment is greater than about 400 μm in diameter.

176. **(previously presented)** The method of Claim 167, wherein the resonator segment is greater than about 500 μm in diameter.

177. **(previously presented)** The method of Claim 167, wherein the resonator segment is less than about 150 μm in diameter.

178. **(previously presented)** The method of Claim 167, wherein the resonator segment is less than about 200 μm in diameter.

179. **(previously presented)** The method of Claim 167, wherein the resonator segment is less than about 600 μm in diameter.

180. **(previously presented)** The method of Claim 167, wherein the resonator segment is less than about 1000 μm in diameter.

181. **(previously presented)** The method of Claim 167, wherein a spectral width of a resonance band of the fiber-ring optical resonator is smaller than an optical channel spacing of the optical WDM system.

182. **(previously presented)** The method of Claim 167, wherein comprising wherein a spectral width of a resonance band of the fiber-ring optical resonator is substantially equal to an optical channel spacing of the optical WDM system.

183. **(previously presented)** The method of Claim 167, wherein a spacing between spectrally-adjacent resonance bands of the fiber-ring optical resonator is greater than an optical channel spacing of the optical WDM system.

184. **(previously presented)** The method of Claim 167, wherein spectrally-adjacent resonance bands of the fiber-ring optical resonator are spaced by about an integer times an optical channel spacing of the optical WDM system.

185. **(previously presented)** The method of Claim 184, wherein the optical WDM system is an optical DWDM system having a channel spacing less than about 400 GHz.

186. **(previously presented)** The method of Claim 184, wherein spectrally-adjacent resonance bands of the fiber-ring optical resonator are spaced by about twice the optical channel spacing of the optical WDM system.

187. **(previously presented)** The method of Claim 167, wherein applying the processing tool to the resonator optical fiber includes removing material from the immediately adjacent portions at least one of the first and second segments of the resonator optical fiber so that a radius of the resonator segment is sufficiently larger than a radius of the immediately adjacent portion of at least one of the first and second segments of the resonator fiber so as to enable the resonator segment to support at least one resonant optical mode near an outer circumferential surface of the resonator segment.

188. **(previously presented)** The method of Claim 187, wherein the resonator segment of the resonator fiber is at least about 0.1 μm larger in radius than the immediately adjacent portion of at least one of the first and second segments of the resonator fiber.

189. **(previously presented)** The method of Claim 187, wherein the resonator segment of the resonator fiber is at least about 0.5 μm larger in radius than the immediately adjacent portion of at least one of the first and second segments of the resonator fiber.

190. **(previously presented)** The method of Claim 187, wherein the resonator segment of the resonator fiber is at most about 20 μm larger in radius than the immediately adjacent portion of at least one of the first and second segments of the resonator fiber.

191. **(previously presented)** The method of Claim 187, wherein the resonator segment of the resonator fiber is at most about 1.5 μm larger in radius than the immediately adjacent portion of at least one of the first and second segments of the resonator fiber.

192. **(previously presented)** The method of Claim 187, wherein material is removed from the resonator optical fiber by surface-masked wet etching of the resonator optical fiber.

193. **(previously presented)** The method of Claim 192, further comprising the step of producing a surface mask on the resonator optical fiber, the surface mask including a primary masked ring substantially covering the resonator segment between unmasked rings on the first and second segments of the resonator optical fiber.

194. **(previously presented)** The method of Claim 193, wherein the unmasked rings are produced by laser machining of a resonator optical fiber outer coating layer.

195. **(previously presented)** The method of Claim 193, wherein the surface mask includes a secondary masked ring adjacent the primary masked ring with a secondary unmasked ring therebetween, the primary masked ring being wider than the secondary masked ring, the secondary masked ring being wider than the secondary unmasked ring, so that upon etching of the resonator fiber an axially-displaced fiber-taper positioning-and-support structure is produced on the resonator optical fiber adjacent the fiber-ring resonator, the positioning-and-support structure including a radially-extending radially-tapered transverse flange.

196. **(previously presented)** The method of Claim 195, wherein the positioning-and-support structure extends completely around the resonator optical fiber.

197. **(previously presented)** The method of Claim 195, wherein the positioning-and-support structure subtends an angle less than about 180°.

198. **(previously presented)** The method of Claim 195, wherein the positioning-and-support structure subtends an angle greater than about 45°.

199. **(previously presented)** The method of Claim 195, wherein the positioning-and-support structure is greater than about 10 μm in length.

200. **(previously presented)** The method of Claim 195, wherein the positioning-and-support structure is greater than about 50 μm in length.

201. **(previously presented)** The method of Claim 195, wherein the positioning-and-support structure is less than about 500 μm in length.

202. **(previously presented)** The method of Claim 195, wherein the positioning-and-support structure is less than about 150 μm in length.

203. **(previously presented)** The method of Claim 192, wherein:
the resonator fiber is a silica-based optical fiber;
the surface mask comprises portions of a hermetic carbon outer coating layer of the resonator optical fiber; and
the etching employs an aqueous-hydro-fluoric-acid-based etchant.

204. **(previously presented)** The method of Claim 192, further comprising the step of removing at least a portion of the surface mask from the resonator optical fiber after etching.

205. **(previously presented)** The method of Claim 192, further comprising the step of leaving at least a portion of the surface mask remaining on at least one of the first and second segments of the resonator optical fiber after etching, the remaining portion of the surface mask serving as an optical mode suppressor.

206. **(previously presented)** The method of Claim 192, further comprising the step of a second surface-masked wet etch, wherein a second surface mask includes an unmasked ring on the resonator segment between masked rings on the resonator segment, so that upon etching of the resonator fiber a radially-displaced fiber-taper positioning-and-support structure is produced on a circumference of the fiber-ring resonator, the positioning-and-support structure including paired axially-juxtaposed radially-extending radially-tapered transverse flanges.

207. **(previously presented)** The method of Claim 167, further comprising the step of adjusting an optical resonance frequency of the fiber-ring resonator after fabricating the fiber-ring resonator on the resonator optical fiber.

208. **(previously presented)** The method of Claim 207, wherein the adjusting step includes irradiating the fiber-ring resonator with ultra-violet light thereby altering the resonance frequency by altering a refractive index of the fiber-ring resonator.

209. **(previously presented)** The method of Claim 207, wherein the adjusting step includes doping the fiber-ring resonator thereby altering the resonance frequency by altering a refractive index of the fiber-ring resonator.

210. **(previously presented)** The method of Claim 207, wherein the adjusting step includes etching the fiber-ring resonator thereby altering the resonance frequency by altering a diameter of the fiber-ring resonator.

211. **(previously presented)** The method of Claim 207, wherein the adjusting step includes depositing optical material on the fiber-ring resonator thereby altering the resonance frequency by altering a diameter of the fiber-ring resonator.

212. **(previously presented)** The method of Claim 167, further comprising the step of providing a radially-extending transverse flange on at least one of the first and second segments of the resonator optical fiber, the flange being adapted for engaging a corresponding groove in an alignment housing.

213. **(previously presented)** The method of Claim 167, further comprising the step of providing a circumferential groove on at least one of the first and second segments of the resonator optical fiber, the groove being adapted for engaging a corresponding flange in an alignment housing.

214. **(previously presented)** A method for fabricating multiple fiber-ring resonators on a resonator optical fiber, the fiber-ring resonators each comprising a transverse fiber-ring resonator segment integral with the resonator optical fiber and separated from each adjacent resonator fiber segment by an intervening fiber segment, the multiple fiber-ring resonators being positioned between first and second segments of the resonator optical fiber, the resonator segments each having a circumferential optical path length sufficiently different from a circumferential optical path length of at least one adjacent intervening segment of the resonator optical fiber so as to enable the multiple resonator segments to support at least one resonant optical mode of a resulting coupled-optical-resonator system near an outer circumferential surface of the resonator segments, the method comprising the steps of:

rotating the resonator optical fiber about a longitudinal relative rotation axis thereof relative to a processing tool; and

spatially selectively applying the processing tool to at least a portion of a surface of the resonator optical fiber thereby producing a difference between the circumferential optical path length of the resonator segments and the

circumferential optical path length of the intervening segments of the resonator optical fiber.

215. **(previously presented)** The method of Claim 214, wherein applying the processing tool includes removing material from intervening segments of the resonator optical fiber so that the radii of the resonator segments are sufficiently larger than the radii of the intervening segments of the resonator fiber so as to enable the multiple resonator segments to support at least one resonant optical mode of a resulting coupled-optical-resonator system near an outer circumferential surface of the resonator segments.

216. **(previously presented)** The method of Claim 215, wherein material is removed from the resonator optical fiber by surface masked wet etching of the resonator optical fiber.

217. **(previously presented)** The method of Claim 216, further comprising the step of producing a surface mask on the resonator optical fiber, the surface mask including multiple masked rings substantially covering the multiple resonator segments between multiple unmasked rings on the intervening segments of the resonator optical fiber.

218. **(previously presented)** The method of Claim 214, wherein the multiple fiber-ring resonators include at least four fiber-ring resonators.

219. **(previously presented)** The method of Claim 214, wherein a spectral width of a resonance band of the coupled-optical-resonator system is smaller than an optical channel spacing of the optical WDM system.

220. **(previously presented)** The method of Claim 214, wherein comprising wherein a spectral width of a resonance band of the coupled-optical-resonator system is substantially equal to an optical channel spacing of the optical WDM system.

221. **(previously presented)** The method of Claim 214, wherein a spacing between spectrally-adjacent resonance bands of the coupled-optical-resonator system is greater than an optical channel spacing of the optical WDM system.

222. **(previously presented)** The method of Claim 214, wherein spectrally-adjacent resonance bands of the coupled-optical-resonator system are spaced by about an integer times an optical channel spacing of the optical WDM system.

223. **(previously presented)** The method of Claim 222, wherein the optical WDM system is an optical DWDM system having a channel spacing less than about 400 GHz.

224. **(previously presented)** The method of Claim 222, wherein spectrally-adjacent resonance bands of the coupled-optical-resonator system are spaced by about twice the optical channel spacing of the optical WDM system.

225. **(previously presented)** The method of Claim 214, wherein:
each of the multiple fiber-ring resonators has substantially the same width, substantially the same diameter, and substantially the same de-coupled resonance frequency; and
each intervening segment has substantially the same width and substantially the same diameter.

226. **(previously presented)** The method of Claim 225, wherein the intervening segments are greater than about 1 μm in width.

227. **(previously presented)** The method of Claim 225, wherein the intervening segments are less than about 20 μm in width.

228. **(previously presented)** The method of Claim 225, wherein:
the intervening segments are between about 5 μm and about 15 μm in width; and
the intervening segments are less than about 0.7 μm smaller in radius than the resonator segments.

229. **(previously presented)** The method of Claim 225, wherein:
the intervening segments are between about 1 μm and about 5 μm in width; and
the intervening segments are greater than about 1 μm smaller in radius than the resonator segments.

230. **(previously presented)** A method for fabricating a fiber-taper alignment-and-support structure on a fiber-taper support fiber, the fiber-taper alignment-and-support structure comprising a taper-support segment integral with the fiber-taper

support fiber between first and second segments of the fiber-taper support fiber, the taper-support segment being adapted for substantially reproducibly and substantially stably positioning a fiber-taper engaged therewith, the method comprising the steps of:

rotating the taper-support optical fiber about a longitudinal relative rotation axis thereof relative to a processing tool; and

spatially selectively applying the processing tool to at least a portion of a surface of the taper-support optical fiber thereby producing the fiber-taper alignment-and-support structure on the taper-support segment of the taper-support optical fiber.

231. **(previously presented)** The method of Claim 230, wherein the positioning-and-support structure extends completely around the taper-support optical fiber.

232. **(previously presented)** The method of Claim 230, wherein the positioning-and-support structure subtends an angle less than about 180°..

233. **(previously presented)** The method of Claim 230, wherein the positioning-and-support structure subtends an angle greater than about 45°.

234. **(previously presented)** The method of Claim 230, wherein the positioning-and-support structure is greater than about 10 μm in length.

235. **(previously presented)** The method of Claim 230, wherein the positioning-and-support structure is greater than about 50 μm in length.

236. **(previously presented)** The method of Claim 230, wherein the positioning-and-support structure is less than about 500 μm in length.

237. **(previously presented)** The method of Claim 230, wherein the positioning-and-support structure is less than about 150 μm in length.

238. **(previously presented)** The method of Claim 230, wherein applying the processing tool to the taper-support optical fiber includes removing material from the immediately adjacent portions at least one of the first and second segments of the taper-support optical fiber so that a radially-extending transverse flange results.

239. **(previously presented)** The method of Claim 238, wherein material is removed from the taper-support optical fiber by surface-masked wet etching of the taper-support optical fiber.

240. **(previously presented)** The method of Claim 239, further comprising the step of producing a surface mask on the taper-support optical fiber, the surface mask including a primary masked ring on the taper-support segment between unmasked rings on the first and second segments of the taper-support optical fiber.

241. **(previously presented)** The method of Claim 240, wherein the unmasked rings are produced by laser machining of a taper-support optical fiber outer coating layer.

242. **(previously presented)** The method of Claim 240, wherein the surface mask further includes an unmasked ring on the taper-support segment between masked rings on the taper-support segment, so that upon etching of the taper-support fiber a fiber-taper positioning-and-support structure is produced on the taper-support fiber, the positioning-and-support structure including paired axially-juxtaposed radially-extending radially-tapered transverse flanges.

243. **(previously presented)** The method of Claim 239, wherein:
the taper-support fiber is a silica-based optical fiber;
the surface mask comprises portions of a hermetic carbon outer coating layer of the taper-support optical fiber; and
the etching employs an aqueous-hydro-fluoric-acid-based etchant.

244. **(previously presented)** The method of Claim 239, further comprising the step of removing at least a portion of the surface mask from the taper-support optical fiber after etching.

245. **(previously presented)** The method of Claim 239, further comprising the step of leaving at least a portion of the surface mask remaining on at least one of the first and second segments of the taper-support optical fiber after etching, the remaining portion of the surface mask serving as an optical mode suppressor.

246. **(previously presented)** The method of Claim 230, wherein applying the processing tool to the taper-support optical fiber includes removing material from

the taper-support segment of the taper-support optical fiber so that a circumferential groove results.

247. **(previously presented)** The method of Claim 246, wherein material is removed from the taper-support optical fiber by surface-masked wet etching of the taper-support optical fiber.

248. **(previously presented)** The method of Claim 247, further comprising the step of producing a surface mask on the taper-support optical fiber, the surface mask including a primary unmasked ring on the taper-support segment between masked rings on the first and second segments of the taper-support optical fiber.

249. **(previously presented)** The method of Claim 247, wherein:
the taper-support fiber is a silica-based optical fiber;
the surface mask comprises portions of a hermetic carbon outer coating layer of the taper-support optical fiber; and
the etching employs an aqueous-hydro-fluoric-acid-based etchant.

250. **(previously presented)** The method of Claim 247, further comprising the step of leaving at least a portion of the surface mask remaining on at least one of the first and second segments of the taper-support optical fiber after etching, the remaining portion of the surface mask serving as an optical mode suppressor.

251. **(previously presented)** The method of Claim 230, further comprising the step of providing a radially-extending transverse flange on the taper-support optical fiber, the flange being adapted for engaging a corresponding groove in an alignment housing.

252. **(previously presented)** The method of Claim 230, further comprising the step of providing a circumferential groove on the taper-support optical fiber, the groove being adapted for engaging a corresponding flange in an alignment housing.